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Published in:
Social Science & Medicine

DOI:
10.1016/j.socscimed.2021.114387

Publication date:
2021

Document Version
Publisher's PDF, also known as Version of record

Social Science & Medicine 289 (2021) 114387

Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed

Longitudinal associations among adolescents' internalizing problems, well-being, and the quality of their relationships with their mothers, fathers, and close friends

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ARTICLE INFO

Keywords:
Adolescence
Internalizing problems
Well-being
Mother
Father
Friendship
Longitudinal
The Netherlands

ABSTRACT

Rationale: Internalizing problems (i.e., depressive and anxiety symptoms) are known to decrease adolescents' well-being, but knowledge about potential underlying mechanisms is limited. The qualities of adolescents' most proximal relationships with their parents and close friends are expected to play a role in the association between adolescents' internalizing problems and well-being.

Objective: The present study was conducted to 1) investigate the indirect longitudinal association between internalizing problems and adolescents' well-being via the quality of adolescents' relationships with *both* their mothers and fathers *and* their close friends, and 2) test whether our findings were gender invariant.

Methods: Data were collected via online questionnaires in two waves at a 12-month interval from adolescents attending three secondary schools in the Netherlands ($N = 1298$; M age = 13.7 years, 53.2% girls). The data were analyzed using a two-wave cross-lagged panel model in R. Multigroup analyses were performed to examine the gender invariance of the findings.

Results: After controlling for baseline levels, results showed that (1) girls, but not boys, who reported more internalizing problems at T1 had lower well-being at T2; (2) girls and boys who reported more internalizing problems at T1 had lower-quality relationships with their mothers, fathers, and close friends at T2; and (3) boys, but not girls, who reported higher-quality friendships at T1 had higher well-being at T2. However, no significant indirect effects between internalizing problems and well-being via the quality of adolescents' relationships with their parents and close friends were detected.

Conclusions: The current study contributes to understanding internalizing problems as an important risk factor to the quality of adolescents' proximal social relationships (parents, friends) and their well-being. The findings support the importance of building high-quality relationships, particularly friendships, and recommend future research to study adolescents' internalizing problems and well-being including gender-specific examinations.

1. Introduction

The increased prevalence of internalizing problems (i.e., depressive and anxiety symptoms) during adolescence is well documented (for reviews, see Bor et al., 2014; Costello et al., 2011). Research has also consistently shown that adolescents with more internalizing problems have lower well-being, both concurrently (Bartels et al., 2013) and longitudinally (Lyons et al., 2013). Well-being is a multidimensional construct defined as a combination of a hedonic conception, focusing on, for instance, happiness, positive emotions, and satisfaction with life, and a eudaimonic conception, comprising good functioning in one's individual endeavors and social life (Diener, 2009; Gallagher et al., 2009). Adolescents' internalizing problems can manifest into (young) adulthood and lead to adverse outcomes throughout their lives (for reviews, see Bor et al., 2014; Costello et al., 2011), but knowledge of the mechanisms potentially underlying this association is limited.

Most previous studies have focused primarily on the identification of direct relationships between internalizing problems and well-being (e.

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https://doi.org/10.1016/j.socscimed.2021.114387
Received 8 June 2020; Received in revised form 9 August 2021; Accepted 6 September 2021
Available online 8 September 2021

g., Bartels et al., 2013; Lyons et al., 2013), and thus focusing merely on mechanisms that occur within persons. Yet, internalizing problems may also be associated with the well-being of adolescents indirectly, through mechanisms that occur between persons, as adolescents also have continuous interactions within their social environment. Empirical research has indeed shown that adolescents' internalizing problems and well-being are intertwined with their social relationships (Young and Mufson, 2008), and specifically with their perceptions of the *quality* of these relationships (e.g., Branje et al., 2010; Miething et al., 2016). Relationship quality is generally characterized by positive (e.g., level of warmth) and negative (e.g., level of conflict) aspects (Furman and Buhrmester, 2009). For instance, internalizing problems can intensify adolescents' perception of negative aspects of social relationships, such as interpersonal difficulties (Rudolph et al., 2009), even leading to social withdrawal (Boivin et al., 1995; Flynn and Rudolph, 2014).

Being the most proximal social contacts, the quality of adolescents' relationships with parents and close friends is particularly important (Bronfenbrenner and Morris, 2006; Smetana et al., 2006). Up to now, direct links among adolescents' internalizing problems, the quality of relationships with parents and (close) friends, and well-being have been investigated separately. Empirical longitudinal research has shown that adolescents with more internalizing problems report lower-quality parent–adolescent relationships one and two years later (Branje et al., 2010), and lower-quality friendships two years later (Kochel et al., 2012). Additionally, the importance of high-quality relationships with parents and close friends for adolescents' well-being is theoretically and empirically recognized (for a meta-analysis, see Chu et al., 2010). Theoretically, high-quality social relationships are resources that allow the realization of well-being (Kesebir and Diener, 2009; Nieboer and Lindenberg, 2002). Empirically, it has been confirmed that adolescents with higher-quality relationships with parents and friends tend to experience higher well-being than adolescents with lower-quality relationships with parents and friends (Chu et al., 2010; Raboteg-Šarić and Šakić, 2014).

While the literature discussed above is relevant to understanding the direct associations among internalizing problems, social relationship quality, and well-being, the theoretical expectation that internalizing problems are associated with adolescents' well-being indirectly through the quality of proximal social relationships has not yet been examined. Several studies investigating indirect effects among different associations have suggested an explanatory role of parent–adolescent relationship and friendship quality. For example, a cross-sectional study showed that high-quality relationships with family members and friends partially explained the association between depressive symptoms and self-reported quality of life in adults receiving hemodialysis (Khalil and Abed, 2014). This finding suggests that internalizing problems (in this case only depressive symptoms) are indirectly related to well-being (measured as quality of life) via decreased social relationship quality. Still, whether and how such findings can be generalized to younger, non-clinical populations remains unclear. We found a few studies conducted among adolescents that examined indirect effects via relationships with parents and close friends, but these assessed different risk factors and outcomes, such as between relational aggression and social-psychological adjustment, which included depressive symptoms (Kamper and Ostrov, 2013), or between stressful life events and psychological distress (Dinizulu et al., 2014). The indirect associations between internalizing problems and well-being via quality of adolescents' relationships with their parents and close friends have not yet been investigated.

Therefore, the present study examined the longitudinal indirect association between adolescents' internalizing problems and well-being via the quality of parent–adolescent relationships and close friendships. Close friendships are distinguished from general friendships, characterized by reciprocal disclosures, similarities in life stages and interests, and sharing activities, by secret-sharing and intimacy (Finkenauer and Righetti, 2011; Way, 2013). We focused on parents and close friends because they are important in adolescents' social worlds, notwithstanding the typical reduction in the amount of time spent with parents and substantial increase in the amount of time spent with peers during adolescence (Bokhorst et al., 2010; De Goede et al., 2009a; Gorrese and Ruggieri, 2012). In addition, the simultaneous investigation of multiple social actors makes sense theoretically, as adolescents develop through continuous interactions with such actors (Bronfenbrenner and Morris, 2006). According to the family systems theory (e.g., Cox and Paley, 1997), families consist of not merely one but several subsystems, including various dyadic family relationships (e.g., mother–child, father–child) that are partly independent and partly interdependent, and as such continuously and reciprocally affect one another. In the present study, we specifically distinguished between adolescents' relationships with mothers and fathers, as research increasingly shows that mothers and fathers play unique roles in the development of children and adolescents (Keizer et al., 2019; Lewis and Lamb, 2003; Nogueira Avelar E Silva et al., 2016).

We hypothesized that adolescents with more internalizing problems would report (1) lower well-being (Bartels et al., 2013) and (2) lower-quality relationships with mothers, fathers, and close friends one year later (Branje et al., 2010; Kochel et al., 2012); (3) that higher-quality relationships with mothers, fathers, and close friends would predict adolescents' greater well-being one year later (Chu et al., 2010; Raboteg-Šarić and Šakić, 2014); and (4) that internalizing problems would be indirectly associated with adolescents' well-being through the quality of adolescents' relationships with their mothers, fathers, and close friends (Dinizulu et al., 2014; Kamper and Ostrov, 2013; Khalil and Abed, 2014). An additional aim of the current study was to test whether our findings were gender invariant given the consistently observed gender differences in internalizing problems (Bartels et al., 2013; Stevens et al., 2018), the qualities of relationships with mothers, fathers, and close friends (Schwartz-Mette et al., 2020; Van Eijck et al., 2012), and well-being (Stevens et al., 2018). As neither theory nor empirical findings indicate clear gender differences in the hypothesized linkages among internalizing problems, social relationship quality with parents and close friends, and well-being, no differences were expected (e.g., Long et al., 2020; Miething et al., 2016).

2. Methods

2.1. Participants and consent

The current study was part of a two-wave longitudinal study of socioecological predictors of adolescents' well-being. Data were collected from adolescents attending three secondary schools in the Netherlands at a 12-month interval (T1 = spring 2018 [grades 7–9], T2 = spring 2019 [grades 7–10]). The participating secondary schools provided active informed consent to the adolescents' participation. At T1 and T2, the adolescents and their parents or guardians received informational letters by email describing the study aims and procedure, the rights to voluntary participation, and confidentiality of data. Informed consent was taken from the parents/guardians as all participants were minors (under 18 years old) at both timepoints. Upon parental or guardian consent, informed consent from adolescents was obtained separately; the adolescents provided face-to-face consent and were allowed to decline participation or withdraw from the study at any time. In total, 6.2% of contacted parents ($n = 84$) and 1.0% of adolescents ($n = 13$) used this opportunity to decline. At T2, parents and adolescents were informed about the study again and had the same opportunity to decline participation. No parents used this opportunity, compared to 0.8% of adolescents ($n = 11$).

The total sample consisted of 1304 adolescents (mean age 13.8 ± 1.1 years, 53.0% girls). At T1, the sample consisted of 1124 adolescents in grades 7–9 (mean age 13.7 ± 1.1 years, 53.3% girls). At T2, 1055 adolescents in grades 7–10 (mean age 14.6 ± 1.1 years, 55.0% girls) participated, and 875 (81.6%) of these adolescents had also participated

at T1. For the present study, we only excluded participants with missing data on all variables of interest ($n = 6$). Consequently, the final analysis sample consisted of 1298 adolescents (mean age 13.7 ± 1.1 years, 53.2% girls). Most (73.3%) participants were enrolled in higher (i.e., senior general [HAVO] and pre-university [VWO]) education; 26.7% were enrolled in lower (i.e., pre-vocational [VMBO]) education. More than half (57.0%) of the participants had Western ethnocultural backgrounds (i.e., they and their parent[s] were born in Europe, the USA, Canada, Australia, or New Zealand); 43.0% of participants had non-Western backgrounds (i.e., they and/or their parent[s] were born in Africa, the Middle East, Asia, or Latin and South America).

2.2. Procedure

At T1 and T2, participants completed online questionnaires in the classroom during regular school hours. The lead researcher and trained research assistants were present during questionnaire administration; they introduced the study and procedure, answered questions, ensured participants' maximum privacy, and guaranteed that their responses were confidential. After completing the questionnaire at each timepoint, participants received small, non-financial incentives (e.g., candy) and a card listing websites with information about topics from the questionnaire and the contact information of the lead researcher in case they had questions. In addition, one gift (e.g., iPhone, PlayStation) per school and one gift card (€5–10, depending on grade) per class were raffled off to participants.

The medical ethics committee of the Erasmus Medical Centre, Rotterdam, the Netherlands, has reviewed the study's research proposal and decided that the rules laid down in the Medical Research Involving Human Subjects Act did not apply (protocol no. MEC-2018-055).

2.3. Measures

2.3.1. Well-being

We used the Mental Health Continuum–Short Form (Keyes, 2005) to measure adolescents' well-being. This 14-item inventory has been validated for use with Dutch adolescents (Luijten et al., 2019) and also showed good reliability in this study (Cronbach's $\alpha = 0.91$ at T1 and 0.92 at T2). Using a six-point scale (0 = never, 5 = every day), respondents rated their degrees of emotional well-being (three items; e.g., "How often did you feel happy?"), psychological well-being (six items; e.g., "How often did you feel good at managing the responsibilities of your daily life?"), and social well-being (five items; e.g., "How often did you feel that you had something important to contribute to society?") in the past month. Mean total scores were calculated, with higher scores indicating greater well-being.

2.3.2. Internalizing problems

To measure internalizing problems, we used the Revised Child Anxiety and Depression Scale-25 (RCADS-25; Ebesutani et al., 2012). This 25-item inventory measures symptoms of anxiety (15 items; e.g., "I worry about things") and depression (10 items; e.g., "Nothing is much fun anymore") on a four-point scale (0 = never, 3 = always). Previous research confirmed the reliability and validity of the depression and anxiety subscales, and indicated that the total score (i.e., sum of the two subscale scores) was a reliable indicator of internalizing problems (Ebesutani et al., 2012). Higher total RCADS-25 scores indicate greater frequencies of depression and anxiety (symptoms of internalizing problems). In the current study, the RCADS-25 also showed good reliability ($\alpha = 0.91$ at T1 and 0.92 at T2).

2.3.3. Parent–adolescent relationship and friendship quality

The quality of adolescents' relationships with their mothers, fathers, and close friends was measured using two subscales from the Network of Relationships Inventory (Furman and Buhrmester, 2009): satisfaction (three items; e.g., "How satisfied are you with the relationship with your mother/father/close friends?") and conflict (three items; e.g., "How much do you and your mother/father/close friends argue with each other?"). Item responses were provided on a six-point scale (1 = none, 6 = the most). The conflict subscale item scores were inverted so that higher scores reflected greater overall relationship quality, and total mother–, father–, and close friend–adolescent relationship quality scores were then calculated (Van de Bongardt, Reitz and Deković, 2016; Verbeek et al., 2020). In our sample, we obtained α values of 0.89 for mothers, 0.90 for fathers, and 0.82 for close friends at T1, and 0.89 for mothers, 0.88 for fathers, and 0.81 for close friends at T2.

2.4. Statistical analyses

Missing value analysis conducted with SPSS (version 27; IBM Corporation, Armonk, NY, USA) indicated that 13.9–22.7% of the total scores across variables and waves were missing, due largely to adolescents' absence at T1 or T2. The majority (95.1%) of participants reported that they had both parents and, thus, reported on the quality of their relationships with both parents. A minority (4.9%) did not, mainly because they reported that they had only a mother or a father. Little's missing completely at random test revealed that the distribution of missing values was not completely random ($\chi^2(128) = 174.47$, $p = .004$). Therefore, all analyses in R were performed using the full information maximum likelihood method (Enders and Bandalos, 2001). To account for nonnormality in the data, robust maximum likelihood estimation was used, which corrects for deviations from multivariate normality by computing robust standard errors and adjusted χ^2 values (Sass et al., 2014; Yuan and Bentler, 2000). For all analyses, the alpha level was set to 5.0%.

Descriptive statistics were calculated for all variables using SPSS (version 27; IBM Corporation, Armonk, NY, USA). Independent-sample *t* tests were performed to compare the mean scores on internalizing problems, relationship quality with mothers, fathers, and close friends, and well-being between boys and girls. Paired-sample *t* tests were performed to compare the mean scores on all variables of interest between T1 and T2. Bivariate correlations were assessed using Pearson correlation coefficients; *r* values of 0.10–0.29 were considered to be low and those of 0.30–0.49 and ≥0 .50 were considered to be moderate and high, respectively (Cohen, 1988).

The study hypotheses were tested using a two-wave cross-lagged panel model (Fig. 1) in R (version 4.0.3; R Core Team, 2020), and the *lavaan* package (Rosseel, 2012). This model included adolescents' internalizing problems; the quality of their relationships with their mothers, fathers, and close friends; and adolescents' well-being. The T1 measures of all variables were allowed to covary (see Appendix A). Two paths were estimated: (1) paths between the measurement of each variable at T1 and T2 (e.g., path between internalizing problems at T1 and internalizing problems at T2), which indicate variable stability over time; and (2) cross-lagged paths (i.e., between the measurement of one variable at T1 and another variable at T2), which indicate the degree to which one variable is related to the future value of the other, after correction for the T1 score for the latter. The direct effect of the main association was given by the path between internalizing problems at T1 and well-being at T2 (path c). To test for indirect effects over time with two waves of data, we assumed stationarity implying that the mean, variance, and autocorrelation structure of the paths are constant over time (Little et al., 2007). Specifically, we assumed that the cross-lagged effects from (1) internalizing problems to relationship quality and (2) from relationship quality to well-being were constant over time and, thus, that the paths from T1 to T2 are equal to hypothetical paths from T2 to T3 if we had more waves of data. We tested for indirect effects by multiplying cross-lagged effects (e.g., effects of internalizing problems at T1 on relationship quality at T2 [Fig. 1, paths a1–a3] × effects of relationship quality at T1 on well-being at T2 [Fig. 1, paths b1–b3]). To test for gender invariance, we performed multigroup analyses regarding the same direct paths (i.e., paths a1, a2, a3, b1, b2, b3, and c) indirect paths

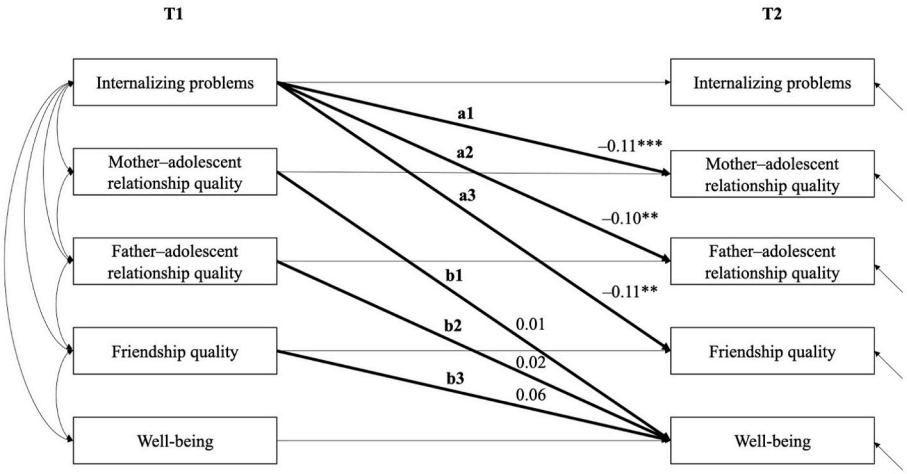

Fig. 1. Two-wave cross-lagged panel model for the testing of longitudinal and indirect associations among adolescents' internalizing problems, relationship quality, and well-being. *Notes*. For clarity, concurrent relationships between variables are not shown in the figure, but in Appendix 1. The direct effect of internalizing problems on well-being of adolescents (path c) is not depicted in the figure. All coefficients are standardized. T1 = baseline assessment, spring 2018; T2 = follow-up assessment, spring 2019. *$p < .05$, **$p < .01$, ***$p < .001$.

in the cross-lagged panel model. To do this, an unconstrained multigroup model, in which each parameter was separately estimated for boys and girls, was compared to constrained models, in which one path at the time was fixed between boys and girls. Gender variance would be indicated by a significant increase/decrease in model fit.

We assessed model fit using the χ^2 statistic, comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Good model fit was indicated by CFI >0.90, RMSEA <0.08, and SRMR ≤0.08 (Bentler and Bonnet, 1980; Hu and Bentler, 1999).

3. Results

3.1. Gender differences and correlations

Descriptive statistics for all variables are presented in Table 1. Almost all means differed significantly between boys and girls at T1 and T2 (all $p < .05$): Boys had higher well-being and higher-quality relationships with their mothers and fathers than did girls, whereas girls had more internalizing problems and higher-quality friendships than did boys. Between T1 and T2, internalizing problems increased and well-being and the quality of all relationships decreased significantly among girls; internalizing problems increased and the quality of relationships with mothers and fathers decreased significantly among boys.

Significant correlations were obtained between all variables (Table 2). Most correlations were weak to moderate. Correlations were found in the expected directions and showed moderate–strong consistency between T1 and T2. Specifically, adolescents' internalizing problems were negatively associated with the quality of relationships with mothers, fathers, and close friends, and with their well-being, whereas the quality of the different relationships (with mothers, fathers, and close friends) were positively associated with each other and with adolescents' well-being, both concurrently and longitudinally.

Table 1
Mean scores on internalizing problems, relationship quality with mothers, fathers, and close friends, and well-being.

	Mean (*SD*)		
	Total sample	Girls	Boys
Internalizing problems T1	11.45 (9.16)	13.70 (10.00)	8.43 (6.93)
Internalizing problems T2	13.00 (10.54)	15.75 (11.11)	9.75 (8.48)
Mother–adolescent relationship quality T1	4.88 (0.75)	4.81 (0.84)	4.94 (0.73)
Mother–adolescent relationship quality T2	4.74 (0.84)	4.64 (0.91)	4.84 (0.80)
Father–adolescent relationship quality T1	4.78 (0.90)	4.66 (0.99)	4.83 (0.91)
Father–adolescent relationship quality T2	4.67 (0.92)	4.51 (1.01)	4.78 (0.90)
Friendship quality T1	4.98 (0.64)	5.03 (0.68)	4.89 (0.65)
Friendship quality T2	4.91 (0.70)	4.93 (0.71)	4.88 (0.72)
Well-being T1	3.37 (0.97)	3.26 (0.96)	3.52 (0.99)
Well-being T2	3.31 (0.98)	3.14 (0.96)	3.53 (0.95)

Independent-sample *t* tests showed that all means except friendship quality at T2 differed significantly between girls and boys ($p < .05$). Paired-sample *t* tests showed that all means differed significantly between T1 and T2 in the total sample ($p < .05$). *SD* = standard deviation; T1 = baseline assessment spring 2018; T2 = follow-up assessment spring 2019.

3.2. Indirect effects

The two-wave cross-lagged panel model including internalizing problems, well-being, and the quality of adolescents' relationships with their mother, father, and close friends showed a good fit ($\chi^2(13) = 18.12$, $p = .153$, CFI = 1.00, RMSEA = 0.02, SRMR = 0.02). All five stability paths were stable (Table 3). Regarding the direct effects of internalizing problems (hypotheses 1 and 2), internalizing problems had significant cross-lagged effects on subsequent well-being after controlling for baseline relationship quality and well-being scores, and on the subsequent quality of adolescents' relationships with their mothers, fathers, and close friends, after controlling for baseline relationship quality scores (Table 3, Fig. 1). The effect sizes of the associations between internalizing problems and the qualities of the relationships with mothers, fathers, and close friends were comparable (i.e., βs of paths a1, a2, and a3 ranged from −0.10 to −0.11), which indicates that adolescents' internalizing problems have similar linkages with their relationship qualities with mothers, fathers, as well as close friends over time. No significant cross-lagged effects were found between mother– and father–adolescent relationship quality and friendship quality and adolescents' well-being over time ($p > .05$).

There were no significant indirect effects between internalizing problems and well-being via the quality of adolescents' relationships with their mothers (β = −0.00, $p = .835$), fathers (β = −0.00, $p = .629$), or close friends (β = −0.00, $p = .103$).

Table 2
Pearson correlations between variables of interest at T1 and T2.

	1	2	3	4	5	6	7	8	9
1. IP T1	–								
2. MoRQ T1	−.39***	–							
3. FaRQ T1	−.32***	.44***	–						
4. FrRQ T1	−.24***	.36***	.28***	–					
5. WB T1	−.50***	.38***	.30***	.30***	–				
6. IP T2	.69***	−.25***	−.25***	−.15***	−.36***	–			
7. MoRQ T2	−.33***	.64***	.32***	.24***	.30***	−.40***	–		
8. FaRQ T2	−.32***	.31***	.68***	.17***	.30***	−.40***	.45***	–	
9. FrRQ T2	−.22***	.25***	.21***	.41***	.24***	−.22***	.35***	.31***	–
10. WB T2	−.44***	.27***	.27***	.22***	.61***	−.57***	.39***	.39***	.30***

T1 = baseline assessment spring 2018; T2 = follow-up assessment spring 2019; IP = internalizing problems; MoRQ = mother–adolescent relationship quality; FaRQ = father–adolescent relationship quality; FrRQ = friendship quality; WB = well-being. ***$p < .001$.

Table 3
Coefficients for adolescents' internalizing problems, relationship quality, and well-being from the two-wave cross-lagged panel model.

Variable	B	SE	β	*p*
Stability paths				
Internalizing problems T1 → T2	0.79	0.036	0.69	<.001
MoRQ T1 → T2	0.69	0.036	0.63	<.001
FaRQ T1 → T2	0.68	0.030	0.68	<.001
FrRQ T1 → T2	0.45	0.040	0.42	<.001
Well-being T1 → T2	0.49	0.033	0.49	<.001
Cross-lagged paths				
Internalizing problems T1 → well-being T2 (path c)	−0.02	0.003	−0.17	<.001
Internalizing problems T1 → MoRQ T2 (path a1)	−0.01	0.003	−0.11	<.001
Internalizing problems T1 → FaRQ T2 (path a2)	−0.01	0.003	−0.10	.001
Internalizing problems T1 → FrRQ T2 (path a3)	−0.01	0.003	−0.11	.003
MoRQ T1 → well-being T2 (path b1)	0.01	0.039	0.01	.837
FaRQ T1 → well-being T2 (path b2)	0.02	0.031	0.02	.628
FrRQ T1 → well-being T2 (path b3)	0.09	0.044	0.06	.055

T1 = baseline assessment spring 2018; T2 = follow-up assessment spring 2019; MoRQ = mother–adolescent relationship quality; FaRQ = father–adolescent relationship quality; FrRQ = friendship quality.

3.3. Gender invariance

The final aim of the current study was to test whether our findings were gender invariant. The unconstrained multigroup model (in which each parameter was separately estimated for boys and girls) showed good model fit (χ^2 (26) = 40.66, p = .034, CFI = 0.99, RMSEA = 0.03, SRMR = 0.03). The fixing of one path at a time revealed significant differences between boys and girls in the effects of internalizing problems ($\Delta\chi^2$ (1) = 4.36, p = .037) and friendship quality ($\Delta\chi^2$ (1) = 9.72, p = .002) on well-being. Specifically, the relationship between internalizing problems and subsequent well-being was significant only among girls ($\beta = -0.22$, $p < .001$), and the relationship between friendship quality and subsequent well-being was significant only among boys ($\beta = 0.16$, $p < .001$). Similar to the total sample, no significant indirect effects between internalizing problems and well-being were found for boys and girls separately.

4. Discussion

Although adolescents with more internalizing problems are known to report lower well-being, knowledge about mechanisms potentially underpinning this association is limited. The purpose of the present study was to examine the longitudinal indirect associations between adolescents' internalizing problems and well-being, via the quality of their most proximal relationships with mothers, fathers, and close friends. In sum, the results showed: (1) that girls, but not boys, with more internalizing problems reported lower well-being one year later (after controlling for baseline well-being); (2) that boys and girls with more internalizing problems reported lower-quality relationships with their mothers, fathers, and close friends one year later (after controlling for baseline relationship quality); (3) that boys, but not girls, with higher-quality friendships reported higher levels of well-being one year later (after controlling for baseline well-being); and (4) that no significant indirect effects between internalizing problems and well-being via the quality of adolescents' relationships with their mothers, fathers, and close friends were identified.

The gender differences in these results suggest the application of gender-specific analyses when studying adolescents' internalizing problems, well-being, and social relationship qualities. Using a comprehensive model including internalizing problems and the quality of adolescents' relationships with parents *and* close friends as predictors of well-being one year later, the current study revealed a significant negative association with girls' (not boys') internalizing problems and a significant positive association with boys' (not girls') friendship quality. These gender differences may be explained by the following factors. First, research suggests that girls do not just experience more internalizing problems and lower well-being than do boys (Bartels et al., 2013; Stevens et al., 2018), as our descriptive analysis indeed confirmed, but that girls also are more susceptible than boys to the deleterious effects of risk factors such as internalizing problems, on different outcomes, such as well-being (Meadows et al., 2006). Second, girls have been found to co-ruminate (i.e., disclose and extensively discuss emotional problems in dyadic relationships) with friends and experience more empathic distress in their friendships than do boys (Smith, 2015). Thus, compared with boys, girls with internalizing problems may have more disturbed and ephemeral friendships, which may affect the strength and stability of the association between friendship quality and well-being. Third, although prior research reveals that girls' friendships typically are deeper and more interdependent than boys' friendships (for a review, see Gorrese and Ruggieri, 2012), there are also studies that revealed the importance of friendships for boys' (and not girls') well-being (Cuadros and Berger, 2016; Graber et al., 2016; Way, 2011). More research is needed to increase our understanding of these gender differences in the linkages between internalizing problems, friendship quality, and well-being.

Notwithstanding the abovementioned gender differences, the negative associations between adolescents' internalizing problems, on the one hand, and the quality of their relationships with their parents and close friends, on the other hand, were found to be gender invariant. Thus, as hypothesized, both boys and girls with more internalizing problems reported lower-quality relationships with mothers, fathers, and close friends over time. These findings support the theoretical suggestion that internalizing problems are intertwined with adolescents' most proximal social relationships and for both genders (Boivin et al., 1995; Flynn and Rudolph, 2014; Rudolph et al., 2009; Young and Mufson, 2008). In addition, these findings resemble prior empirical

research, showing that adolescents with more internalizing problems report lower-quality relationships with parents and close friends (Branje et al., 2010; Kochel et al., 2012). Future studies are needed to increase our understanding of the mechanisms underlying the links between adolescents' internalizing problems and their relationships with parents and close friends.

One unanticipated finding was the lack of a significant association between mother– or father–adolescent relationship quality and adolescents' subsequent well-being. Previous research showed that adolescents with higher-quality parent–adolescent relationships tend to have higher levels of well-being than do those with lower-quality parent–adolescent relationships (for a meta-analysis, see Chu et al., 2010). This difference may be explained by our use of a comprehensive and strict model including relationships with mothers, fathers, *and* close friends, while controlling for baseline levels of well-being at T1. Such an approach is appropriate, given the interrelationships among all of these variables (Bokhorst et al., 2010; De Goede et al., 2009b; Oberle et al., 2011) and as adolescents develop through continuous interactions with these actors (Bronfenbrenner and Morris, 2006). In addition, descriptive analyses revealed that the adolescents in our sample had high well-being levels at T1; considering the longitudinal stability of well-being (Eid and Diener, 2004; Miething et al., 2016), little variance attributable to parent–adolescent relationship quality may have remained beyond the initial levels of well-being and friendship quality.

Finally, no indirect effect between the association of adolescents' internalizing problems with well-being via relationship quality was found in contrast to our expectations based on previous studies (e.g., Kamper and Ostrov, 2013; Khalil and Abed, 2014). This difference may be due to differences in study design, methodology, population, and variables of interest. Khalil and Abed's (2014) research was cross-sectional and conducted with an adult clinical population, and Kamper and Ostrov's (2013) research focused on adolescents' externalizing problems and did not involve control for previous levels of outcome variables. We, on the contrary, conducted this research with a school-based adolescent sample using a strict longitudinal design with control for baseline levels of well-being. We recommend that the same model be tested with adolescents experiencing (sub)clinical levels of internalizing problems, in whom the indirect effect of relationship quality is expected to be significant (Khalil and Abed, 2014). In future investigations, researchers may also distinguish among emotional, psychological, and social well-being, when testing indirect effects via the quality of adolescents' relationships with their parents and close friends.

4.1. Strengths, limitations, and suggestions for future research

The strengths of the current study include the participation of a large, culturally diverse sample of adolescents, the use of a longitudinal design, the consideration of positive and negative aspects of social relationship quality, the inclusion of data on relationships with parents and friends in the same model, and the separate examination of mother– and father–adolescent relationships. Nonetheless, the present study also has some limitations that need to be considered.

First, our findings are potentially subject to response bias, as all variables were assessed using adolescents' retrospective self-reports. For example, adolescents with more and fewer internalizing problems might have answered questions about relationship quality and well-being differently (De Los Reyes et al., 2008). Moreover, our reliance on a single type of informant (adolescents) may have provided a one-sided view on relationship quality; parents and close friends could perceive these relationships differently (Filus et al., 2019). Future research would benefit from the inclusion of multi-wave data collection from parents and close friends, in addition to adolescent self-reports, and the evaluation of discrepancies among informant types.

Second, without replication, the results of this study cannot be generalized beyond non-clinical school-based samples of Dutch adolescents. On average, Dutch adolescents are among the happiest and most satisfied with their lives globally (Stevens et al., 2018). Adolescents in the Netherlands have the highest ranked well-being, exceeding that in other Western countries such as Portugal, Hungary, and the United States, and better relationships with their mothers, fathers, and close friends than do, for instance, adolescents in France and the United States (Bradshaw et al., 2013). Findings of studies conducted with other (sub-) clinical and non-clinical adolescent samples and in other countries may differ (e.g., Khalil and Abed, 2014).

Third, the cross-lagged panel model tested in the current study assumed stationarity, i.e., the constancy of the autoregressive and cross-lagged paths in the longitudinal cross-lagged panel model to test the presence of indirect over-time effects using two-wave data. This seems reasonable given the documented stability of adolescents' internalizing problems and well-being over time (Danneel et al., 2019; Eid and Diener, 2004; Miething et al., 2016; Nelemans et al., 2014). Yet, as we were not able to empirically test the validity of this assumption with our data, future research is recommended to use three or more waves of data. In addition, longitudinal studies with more than two waves of data can include bidirectional paths to further increase our understanding of the directionality of these complex interrelationships among adolescents' internalizing problems, proximal social relationships, and well-being as these associations may be reciprocal (Branje et al., 2010; Gaertner et al., 2010; Miething et al., 2016).

5. Conclusions

Notwithstanding its limitations, the current study has relevant implications for public health policies, in which adolescents' internalizing problems and well-being are increasingly recognized as major priorities (Parkin et al., 2019; World Health Organization, 2013). First, the study findings support the importance of friendships for the well-being of adolescents, even those with internalizing problems, and after controlling for the quality of adolescents' relationships with their mothers and fathers. Currently, few prevention and intervention programs addressing adolescents' internalizing problems target friendships as a mechanism for the promotion of positive change, for instance the enhancement of well-being (Hart and Heaver, 2013). Nonetheless, interventions targeting adolescents' internalizing problems that focus on interpersonal relationships (including friendships) have been found to lead to successful symptom mitigation among adolescents (Cohen et al., 2015; Young and Mufson, 2008). Such findings are in accord with the positive psychological perspective (Seligman, 2010), which proposes that the identification and promotion of adolescents' strengths and resources can enhance their well-being, even in the presence of risk factors such as internalizing problems. Consequently, we recommend that these professionals invest in parent–adolescent relationships, for instance by enhancing parents' and adolescents' emotion regulation (Cheung et al., 2020), to decrease adolescents' internalizing problems. We also recommend that mental health professionals prioritize the maintenance of existing friendships and the formation of new friendships in order to improve the well-being of adolescents with internalizing problems.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

The authors would like to express their great appreciation to all the adolescents who participated in this study.

Appendix A. Concurrent covariances of adolescents' internalizing problems, relationship quality, and well-being in the two-wave cross-lagged panel model

Variables	B	SE	β	*p*
Internalizing problems T1 – well-being T1	−4.45	0.337	−0.50	<.001
Internalizing problems T1 – MoRQ T1	−2.84	0.289	−0.39	<.001
Internalizing problems T1 – FaRQ T1	−3.00	0.293	−0.34	<.001
Internalizing problems T1 – FrRQ T1	−1.45	0.232	−0.24	<.001
MoRQ T1 – FaRQ T1	0.35	0.030	0.44	<.001
MoRQ T1 – FrRQ T1	0.19	0.019	0.36	<.001
MoRQ T1 – well-being T1	0.30	0.028	0.38	<.001
FaRQ T1 – FrRQ T1	0.19	0.022	0.29	<.001
FaRQ T1 – well-being T1	0.30	0.030	0.31	<.001
FrRQ T1 – well-being T1	0.20	0.023	0.31	<.001
Internalizing problems T2 – well-being T2	−2.63	0.386	−0.46	<.001
Internalizing problems T2 – MoRQ T2	−1.42	0.246	−0.29	<.001
Internalizing problems T2 – FaRQ T2	−1.48	0.251	−0.29	<.001
Internalizing problems T2 – FrRQ T2	−0.62	0.227	−0.13	.007
MoRQ T2 – FaRQ T2	0.18	0.022	0.41	<.001
MoRQ T2 – FrRQ T2	0.12	0.018	0.28	<.001
MoRQ T2 – well-being T2	0.13	0.022	0.27	<.001
FaRQ T2 – FrRQ T2	0.12	0.018	0.27	<.001
FaRQ T2 – well-being T2	0.15	0.023	0.29	<.001
FrRQ T2 – well-being T2	0.09	0.020	0.19	<.001

T1 = baseline assessment spring 2018; T2 = follow-up assessment spring 2019; MoRQ = mother–adolescent relationship quality; FaRQ = father–adolescent relationship quality, FrRQ = friendship quality.

Credit author statement

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